



IMC

New Wales Complex

Plant Overview

SITE: Florida Phosphate
BREAK: 17.1
OTHER: V.1



10583987

INTRODUCTION

Welcome to IMC's New Wales concentrated phosphates complex. We are proud of our facilities and of our skilled, dedicated employees who work around the clock to provide the world's farmers with quality phosphate crop nutrients and animal feed ingredients.

New Wales is the largest plant of its kind in the world, distinguished by the economies of large-volume production, innovative use of technology, attention to quality control, achievement in product recovery, and modern, well-maintained facilities.

The major end product at New Wales is diammonium phosphate (DAP). Also produced are merchant grade phosphoric acid, granular monammonium phosphate (GMAP), animal feed supplements, monoammonium phosphate (MAP), merchant acid and sulfuric acid. The animal feed products include defluorinated calcium phosphates (Dynafos®, Biofos® and Multifos®), plus an ammoniated phosphate (Monofos®).

New Wales employs approximately 900 people with an annual payroll of over \$35 million.

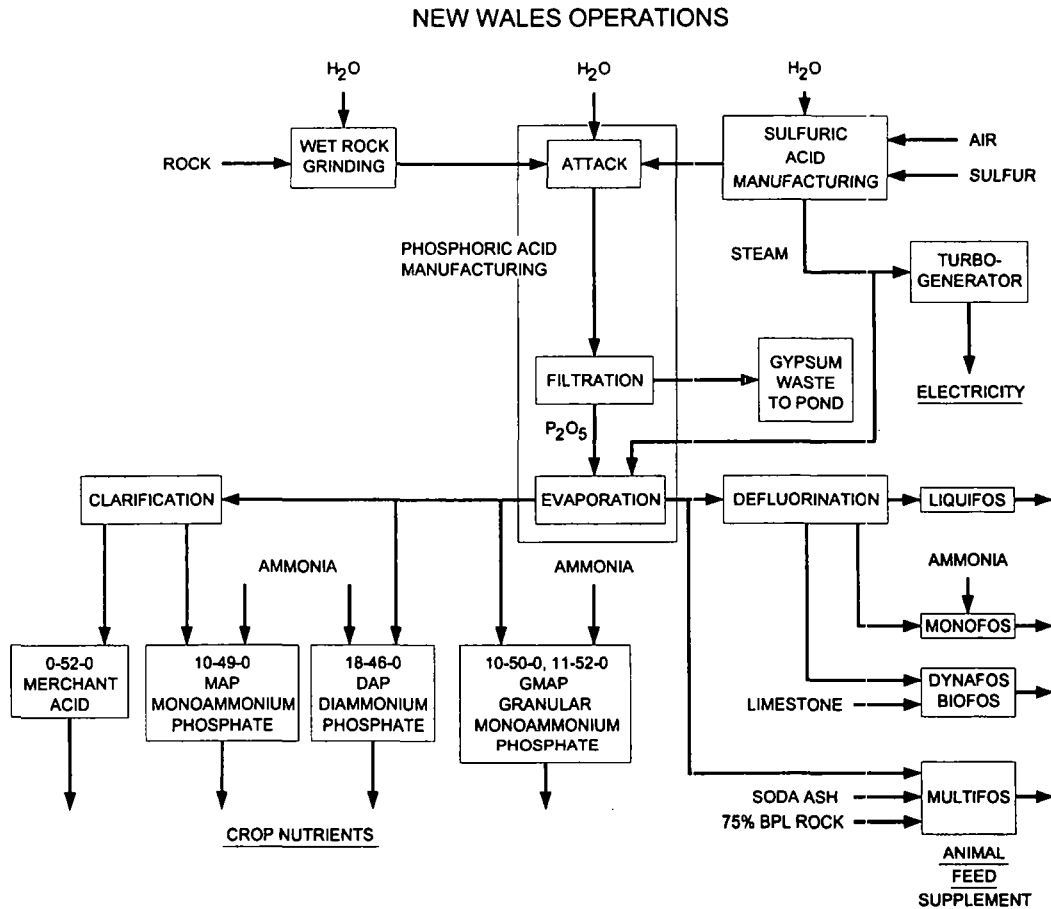
The plant site is three-quarters of a mile long by one-half mile wide, with the farthest point of the gypsum stack being two miles away.

This booklet is designed to be a reminder of your visit. Tonnages and other figures listed are based on production capacities. We sincerely appreciate your interest in New Wales, and thank you for giving us the opportunity to demonstrate our pride in this world-class operation.

PLANT MATERIAL FLOW

The New Wales Operation of IMC is the world's largest grassroots facility for the manufacture of phosphoric acid and concentrated products. This complex can produce 1,900,000 tons/year of phosphoric acid expressed as P_2O_5 .

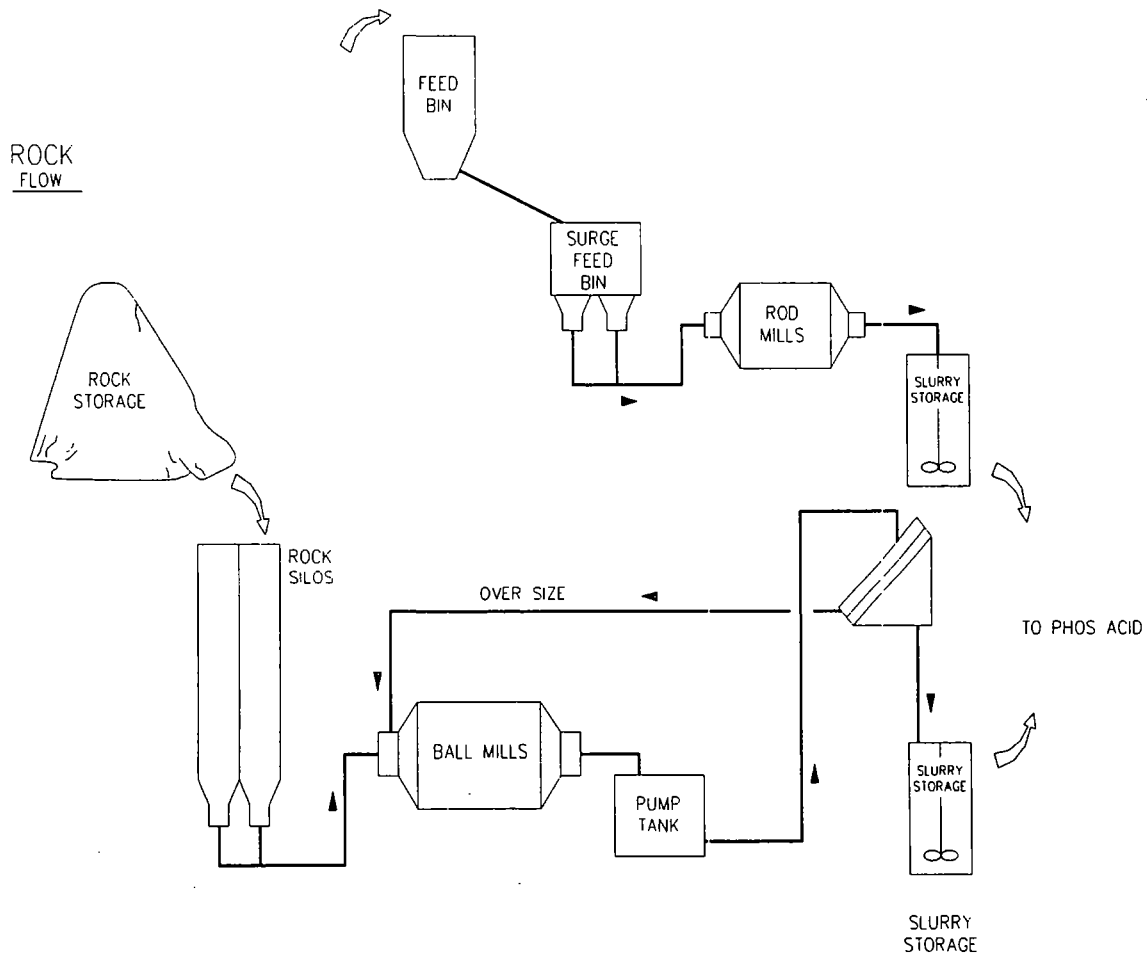
The normal daily consumption of 64% BPL (bone phosphate of lime) grade phosphate rock is about 19,000 tons. This rock is supplied by IMC's nearby mines and is stored on the wet rock storage pile.



ROCK GRINDING

Wet, unground phosphate rock with about 10% moisture is received by rail cars and trucks from IMC mines in the vicinity. Wet rock, consisting of pebble and small grains of rock called concentrate, is unloaded by conveyor belts and stored outdoors. This storage pile contains 250,000 tons of rock, enough for about two weeks of production. A pair of traveling stacker conveyors places the incoming rock in two piles. The rock is withdrawn from these piles simultaneously and blended on the belt, which runs through a tunnel beneath the pile. This provides more uniform feed to produce high-quality end products.

Rock is reclaimed from the storage pile and conveyed to storage silos. From here, it is fed to two rod mills and two ball mills operating in parallel. The rod mills operate in "open circuit," which means that the product goes directly to the ground rock storage tanks. The ball mills operate in "closed circuit," during which screens remove product-sized material from the mill discharge and return the oversized material for more grinding.



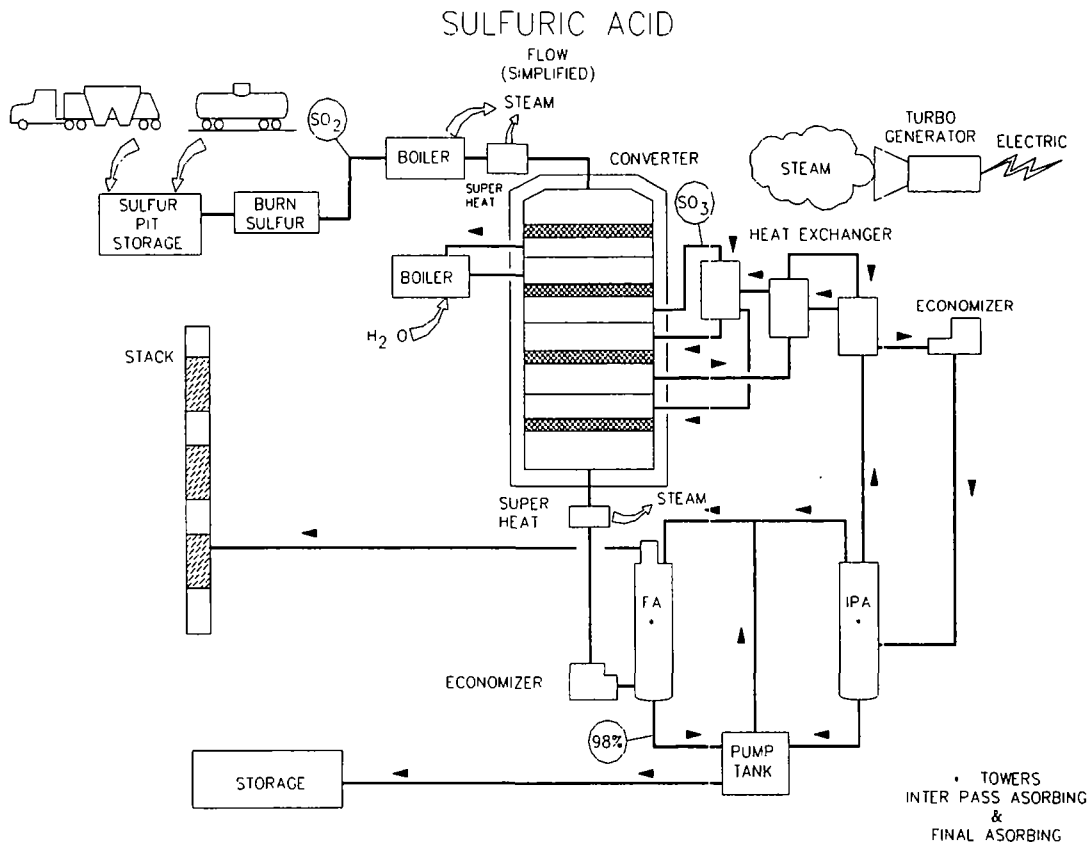
SULFURIC ACID PRODUCTION

The complex sulfuric acid demand is 14,000 tons per day (TPD) of 100% H_2SO_4 . This acid is produced in five double-absorption plants. Approximately 4,500 tons of sulfur are consumed daily.

Molten sulfur is burned with air at 2,000 degrees Fahrenheit in a horizontal brick-lined furnace to produce gaseous sulfur dioxide. This gas is then reacted with more air at 800 to 1,000 degrees Fahrenheit, in the presence of a special vanadium pentoxide catalyst, to produce gaseous sulfur trioxide. This gas is absorbed into a mixture of water and sulfuric acid in towers to produce sulfuric acid.

Stack gases must be cleaned to a level that is equivalent to 99.7% efficiency. The New Wales sulfuric acid plants meet this requirement by utilizing the double absorption process. Sulfur trioxide is absorbed into water in two steps. The first results in an efficiency of 90%, while the second results in an efficiency of 99.7%.

Large amounts of steam are produced during the manufacture of sulfuric acid. This steam provides the heat necessary to concentrate phosphoric acid and also to produce electricity. Two turbine generators produce over 400 million kilowatt hours per year-better than 90% of New Wales' electricity needs. Excess electricity from the New Wales generators is transmitted on a private line to IMC's nearby Kingsford phosphate rock beneficiation plant.



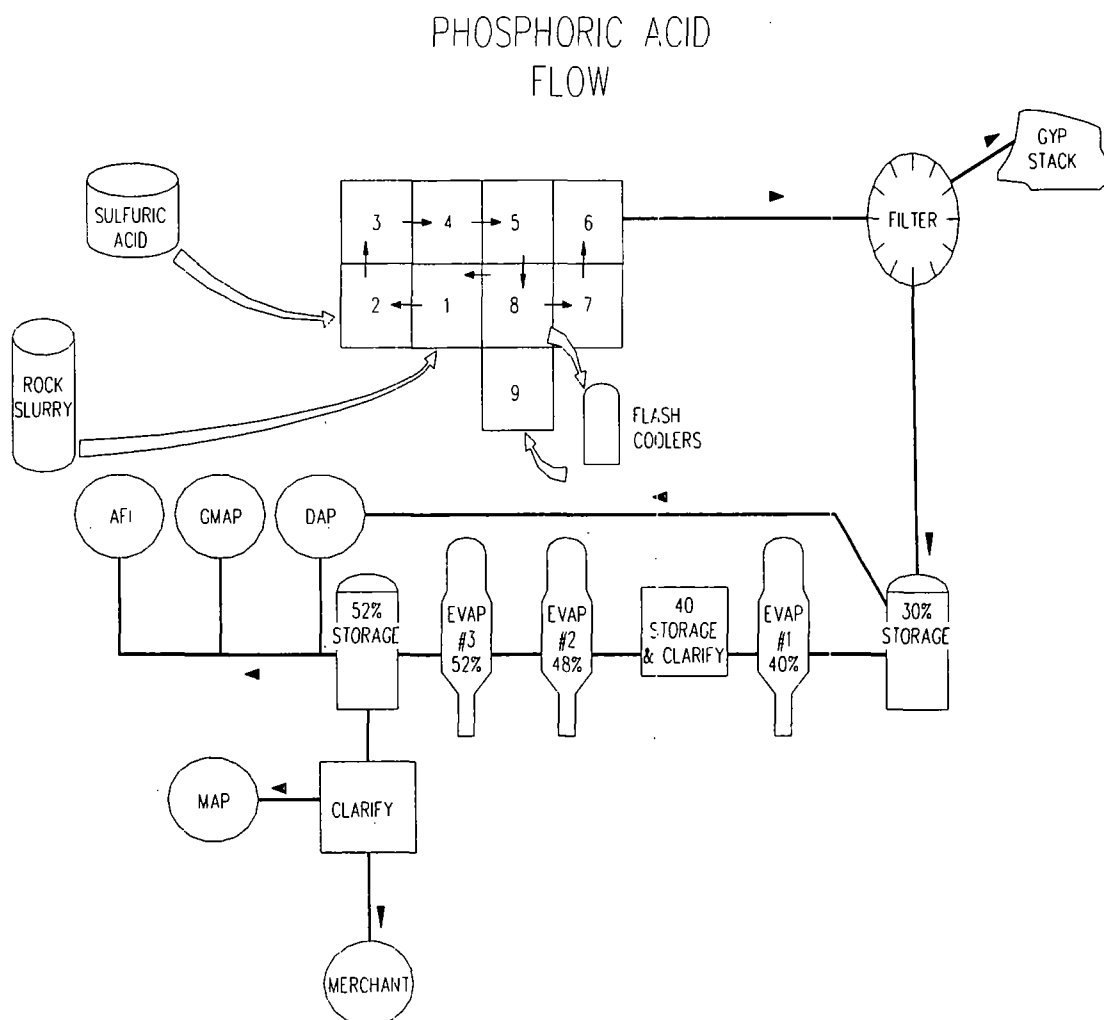
PHOSPHORIC ACID PRODUCTION

The three Prayon wet process phosphoric acid plants have a combined capacity of 1,900,000 TPY of P_2O_5 , as 27% acid. They are comprised of two identical Mark III trains and a new generation Mark IV plant. The basic raw materials for the phosphoric acid plants are 64 BPL ground phosphate rock and 98% sulfuric acid.

Phosphoric acid is produced by reacting ground phosphate rock with sulfuric acid in large, concrete, multi-compartmented vessels called attack tanks. Here, agitation and retention time allow for the crystallization of gypsum. The resulting 27% P_2O_5 and gypsum are separated on Bird-Prayon tilting pan filters.

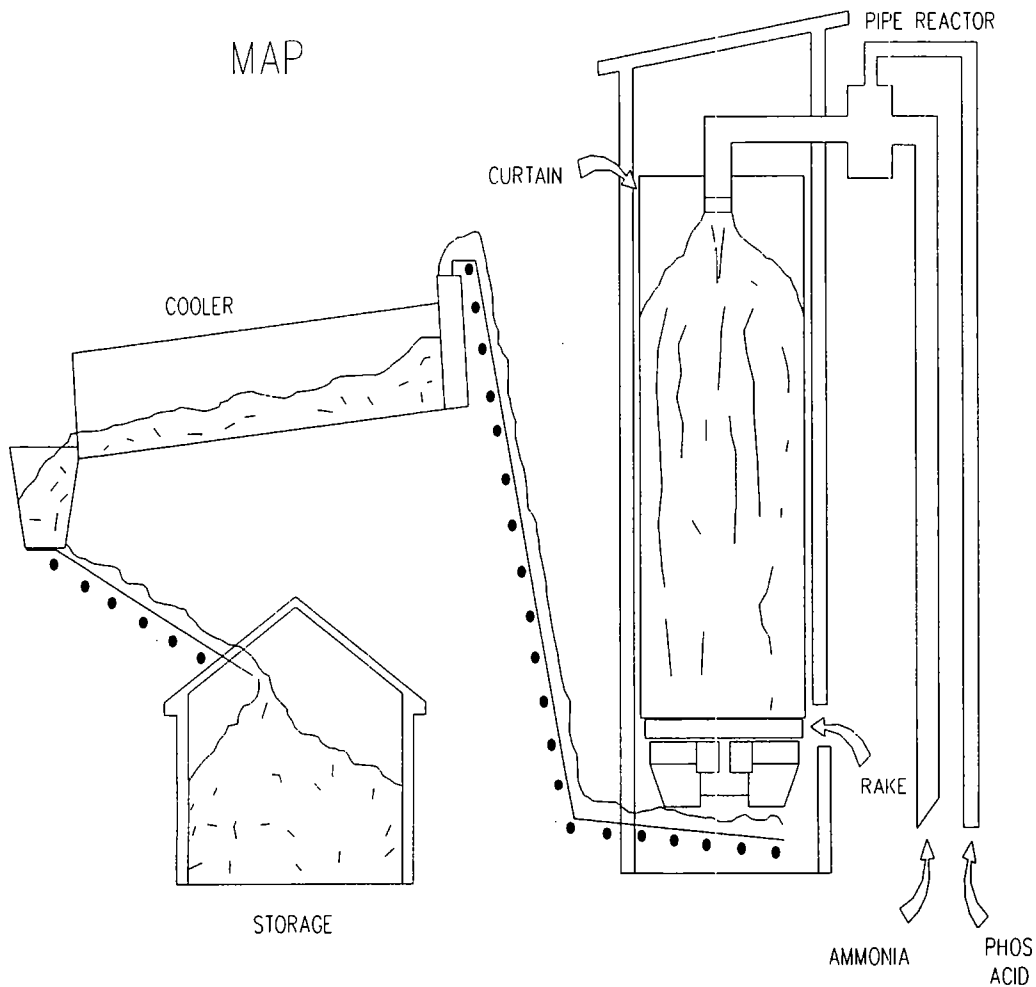
The gypsum is mixed with water from the gypsum pond and the mixture is pumped to the top of the gypsum stack to settle out. Almost 10,000,000 tons per year of gypsum are produced at New Wales.

The weak phosphoric acid is concentrated by evaporation to 52% acid. This acid may be clarified for direct sales or processed into dry products.



MAP PRODUCTION (POWDER)

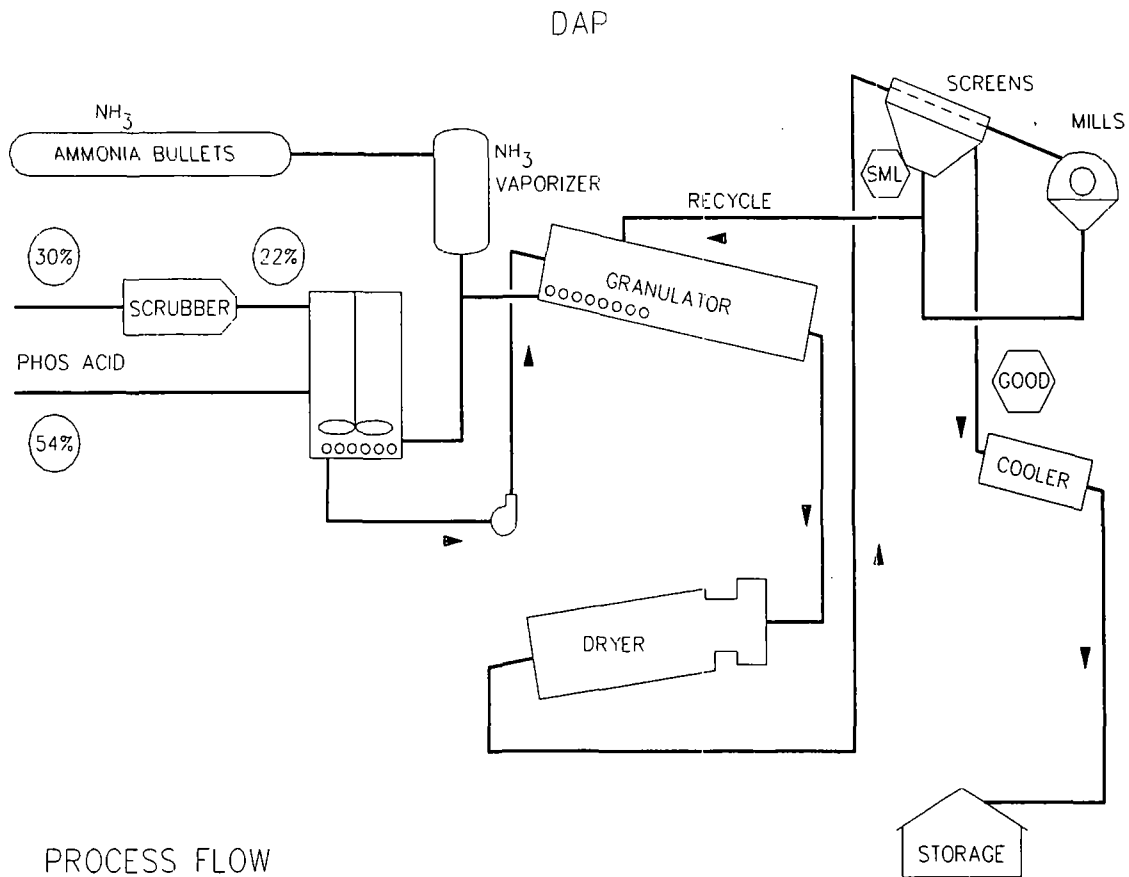
Approximately 1,800 TPD of P_2O_5 as 52% P_2O_5 acid is clarified by nozzle centrifuges to produce merchant grade phosphoric acid. A by-product of this clarification is impure phosphoric acid sludge. This sludge is reacted with ammonia in a spray tower to produce 1,200 TPD of non-granular monoammonium phosphate (MAP). MAP is a 10-49-0 analysis fertilizer used in bulk blends, suspension fertilizers and granulation plants.



PROCESS FLOW

DAP PRODUCTION

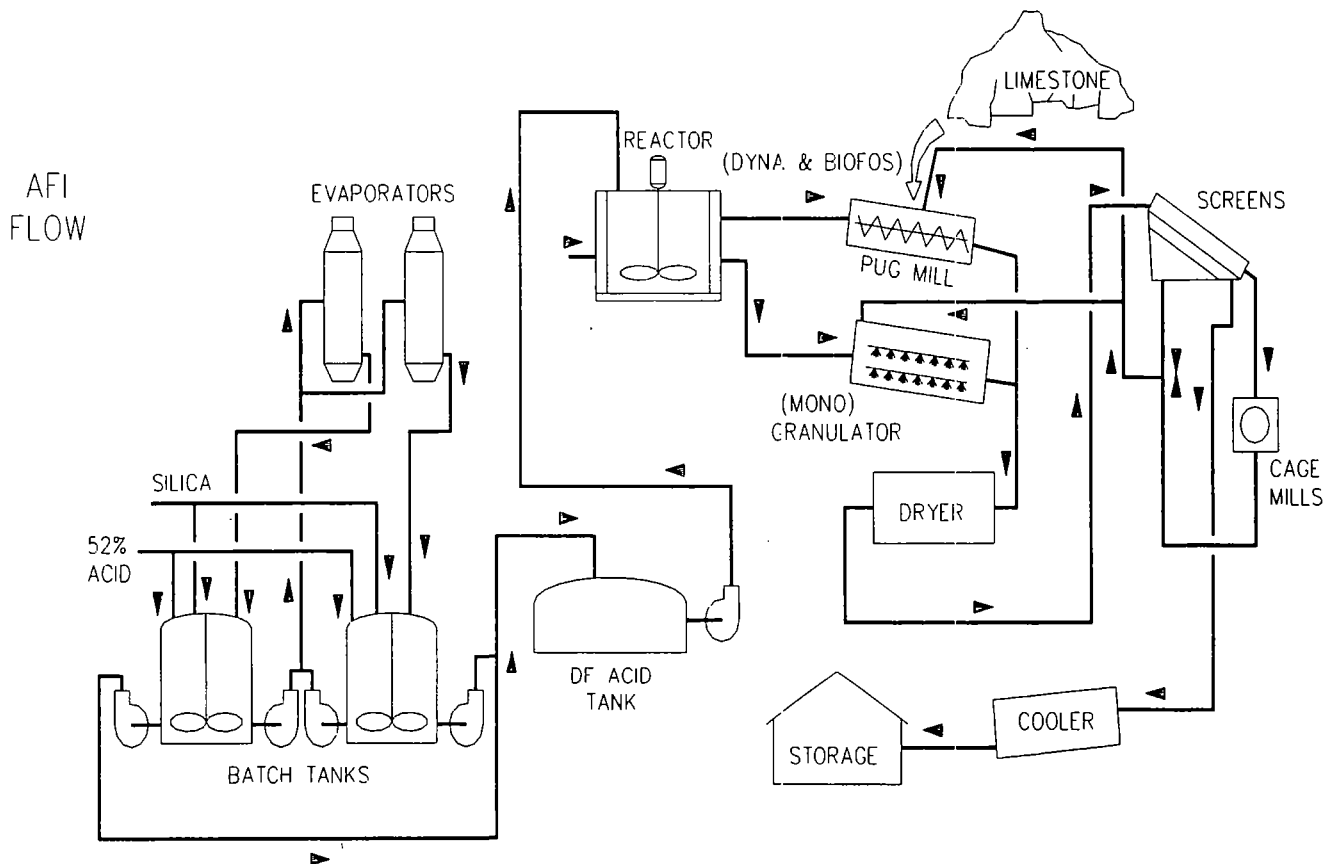
The highest volume product manufactured at New Wales is diammonium phosphate (DAP), an 18-46-0 fertilizer. DAP is made by reacting phosphoric acid with ammonia. The ammoniated slurry is then granulated into a spherical particle that is approximately 3 mm in diameter. New Wales can produce 9,000 TPD of DAP using three plants. New Wales also has the capability of producing granular monoammonium phosphate – GMAP (11-52-0 or 10-50-0).



ANIMAL FEED PRODUCTION

IMC is among the world's largest producers of animal feed ingredients. Animal feed is made in two production facilities at New Wales. All animal feed products require fluorine removal. In one process, phosphoric acid is chemically defluorinated. In the other, phosphate rock and phosphoric acid are thermally defluorinated.

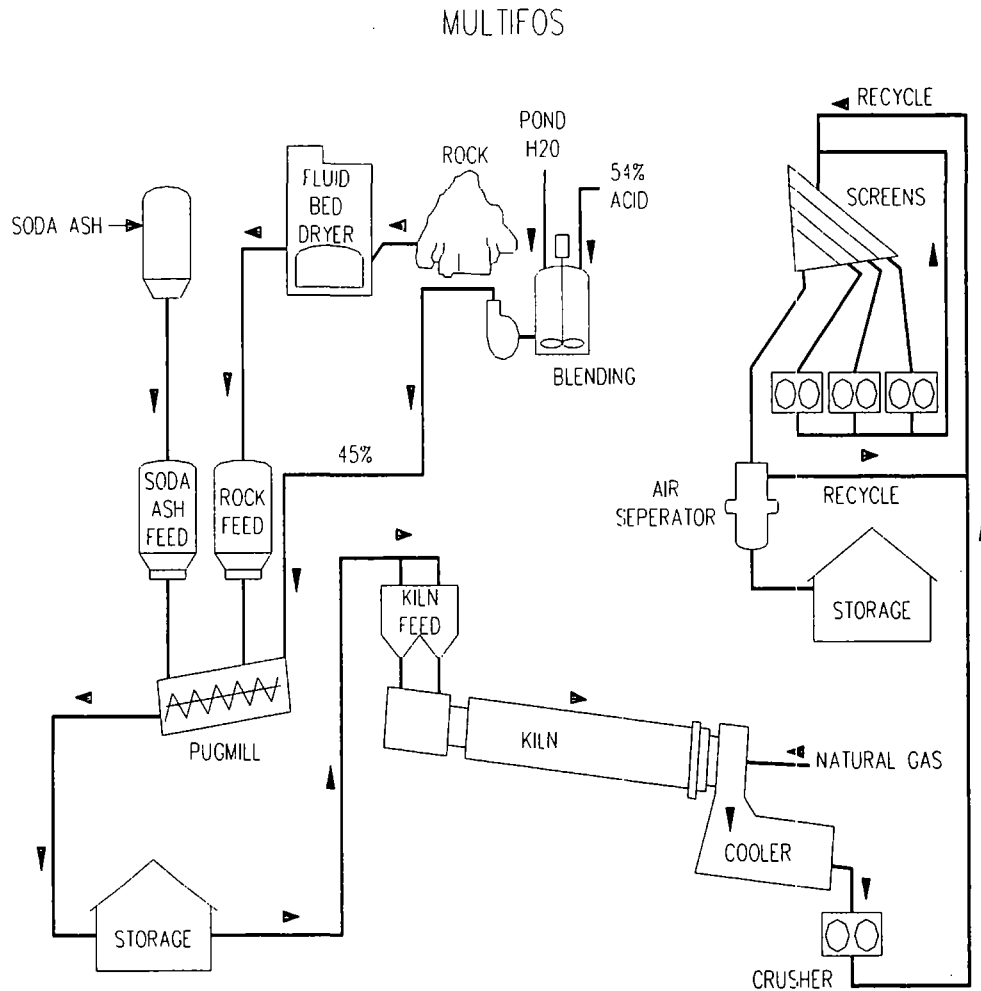
In the AFI (Animal Feed Ingredients) plant, limestone is reacted with defluorinated phosphoric acid to produce Dynafos® and Biofos®, trademark names for dicalcium and monocalcium phosphates, which are used primarily in cattle and swine feeds. Monofos® is produced with ammonia and defluorinated acid; this product is used primarily in cattle feed.



PROCESS FLOW

MULTIFOS PRODUCTION

The second animal feed plant makes Multifos, a tricalcium phosphate used primarily in poultry feed. It is produced at high temperatures by combining dry phosphate rock, soda ash, and phosphoric acid.



PROCESS FLOW

QUALITY CONTROL

Attention to quality is of paramount importance at New Wales, from the delivery of raw materials to the shipment of finished products. Throughout the operation, employees work to make sure that we are meeting customer expectations. Close attention is paid to details such as, nutrient value, product sizing, application of dust control agents and various other customer specifications.

New Wales has the phosphate industry's most computerized, automated Quality Control Laboratory. An experienced staff of chemists and technicians keep this state-of-the-art facility operating around the clock. Typically 3,000 tests are run every 24 hours, a workload that is aided by extensive use of bar coding and computer-integrated analytical instruments. Analytical results are sent electronically to the production units on a timely basis and the same information flows into the company-wide computer system every ten minutes.

The New Wales Operation also includes utilities generation and distribution, raw materials handling, and end product shipping. There are three fertilizer shipping units for either rail or trucks. There is a fourth shipping unit that handles only the animal feed products.